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NOTES

THIRD PARTY LIABILITY OF THE PRIVATE SPACE INDUSTRY: TO PAY WHAT NO ONE HAS PAID BEFORE

Private launchers of spacecraft currently face a perplexing array of possible domestic and international tort liability. The risk of such liability could discourage some private launchers from further developing outer space, thereby undermining the United States' goal of achieving aerospace preeminence. The author proposes both streamlining domestic and international tort law in this area and placing financial caps on damage awards to third parties injured by private spacecraft.

INTRODUCTION

PPRIVATE ENTERPRISE IN the United States is now in the business of launching spacecraft. Two recent events mark the fruition of the Reagan administration's policy to open development and exploration of outer space to private organizations.¹ First, on March 29, 1989, Space Services, Inc. ("Space Services") launched *Starfire One*, the first commercially licensed spacecraft launch in the United States.² *Starfire One* carried an experimen-

1. The policy seeks to encourage private development of outer space by "bring[ing] into play America's greatest asset — the vitality of our free enterprise system." Comment, *Legal Aspects of the Commercialization of Space Transportation Systems*, 3 HIGH TECH. L.J. 99, 102 n.19 (1989) (quoting President's Radio Address to the Nation, 20 WEEKLY COMP. PRES. DOC. 113-14 (Jan. 28, 1984)).

2. Boehler, *Paper Trails to Contrails: Starfire 1 Boosts Free Enterprise and Suborbital Payloads*, AD ASTRA, June 1989, at 39, 39.

tal, privately owned payload on a suborbital flight around the earth.³ Space Services also anticipates launches of orbital satellites boosted by its more powerful Conestoga One rocket.⁴

The second milestone achieved by the private space industry was the August 1989 launch of a communications satellite by McDonnell Douglas Space Systems Company ("McDonnell Douglas").⁵ This launch was the "first launch ever of a satellite into earth orbit by a private corporation."⁶ Unlike the Space Services operation, the McDonnell Douglas satellite was launched from a government owned facility with the assistance of government contractors.⁷ The two missions present a complete picture of possible private sector launches: suborbital or orbital payloads using private or public facilities.

Legal considerations necessarily accompany private enterprise into outer space. The private development of outer space creates exposure to potentially astronomical liability to third parties⁸ injured by malfunctioning spacecraft or rocket boosters. Illustrative of the magnitude of risk faced by the space industry is the October 18, 1989 launch of the *Galileo* interplanetary explorer.⁹ The *Galileo* is a nuclear fueled satellite that was carried into outer space aboard the space shuttle *Atlantis*.¹⁰ Although *Galileo* itself will be in earth's orbit only for a short period of time,¹¹ the

3. Specifically, *Starfire One* carried a 650 pound payload consisting of "six experiments primarily designed to explore how various materials react when manufactured in the vacuum of space." *Id.*

4. Space Services' project manager believes that the programs employing the Conestoga rocket are "where we're going to make our big bucks" because of a significantly greater payload capacity. *Id.* at 41.

5. *America's Private Road to Heaven*, U.S. NEWS & WORLD REP., Sept. 11, 1989, at 11, 11-12.

6. *Id.* at 11.

7. *Id.* (McDonnell Douglas utilized Cape Canaveral's facilities and services).

8. For the purposes of this note, "third party" will be defined as in the Commercial Space Launch Act Amendments, which define "third party" as any person or entity not actively involved in the launch of the spacecraft. The Commercial Space Launch Act Amendments of 1988, 49 U.S.C. § 2603(11)(A)-(D) (1988); see *infra* text accompanying notes 47-57.

9. See generally Covault, *Shuttle Launch of Galileo Jupiter Mission Highlights U.S. Space Science Renaissance*, AVIATION WEEK & SPACE TECH., Oct. 23, 1989, at 22 (describing details of the *Galileo* launch).

10. See generally Foley, *NASA Prepares for Protests Over Nuclear System Launch on Shuttle in October*, AVIATION WEEK & SPACE TECH., June 26, 1989, at 83 (analyzing public fears of nuclear power sources in outer space.)

11. *Galileo* was carried in space shuttle *Atlantis*'s cargo bay and deployed into outer space after the shuttle attained its holding orbit. Once deployed, the probe left earth's orbit on its trek to Jupiter. However, once outside earth's orbit, *Galileo* will perform a "gravity

danger of liability still exists: a launch accident or unplanned reentry of the craft could result in significant radioactive contamination of the earth's atmosphere or surface.¹²

The *Galileo* project was exclusively a governmental endeavor; consequently private industry risked no liability with respect to that particular launch. Nevertheless, the *Challenger* accident demonstrates that private industry will encounter ever increasing dangers as it advances in the development and exploration of outer space. Nuclear powered spacecraft are good examples of such danger because progress in space necessarily involves using compact, reliable power sources such as nuclear energy.¹³ But even without the possibility of radioactive contamination, a privately owned space object of significant size represents an unusual and potentially significant hazard to third parties throughout the world.¹⁴

The risk of liability accompanying commercial advances in outer space should not be allowed to impede the space launch industry's progress.¹⁵ Excessive liability could deter the en-

assist fly-by maneuver" past Venus, followed by two earth "gravity assist fly-bys" in December 1990 and December 1992. These maneuvers will provide sufficient velocity for the space vehicle to reach Jupiter in December 1995. According to the National Aeronautics and Space Administration ("NASA"), the threat of reentry during one of these fly-bys is one in ten million. *Id.* at 87.

12. Past launch accidents are illustrative of this danger. For instance, the space shuttle *Challenger* exploded only 74 seconds after lift-off on Jan. 28, 1986. Broad, *The Shuttle Explodes: 6 in Crew and High School Teacher Are Killed 74 Seconds After Liftoff*, N.Y. Times, Jan. 29, 1986, at A1, col. 1. If it were carrying a nuclear power source, as the *Galileo* space probe did, it might have caused dispersion of radioactive debris along the east coast of Florida. However, the force of such an explosion would have to be great enough to rupture the fuel's protective capsule, which NASA claims is unlikely. See Foley, *supra* note 10, at 85-87 (discussing field testing of *Galileo's* nuclear fuel container).

13. See Straubel, *Space Borne Nuclear Power Sources — The Status of Their Regulation*, 20 VAL. U.L. REV. 187, 188 (1986) (characterizing nuclear power as "reliable," "relatively light," long-lasting, and capable of producing great quantities of heat and energy).

14. The United States has the ability to place extremely large spacecraft into orbit. For instance, *Titan 402* can carry a payload weight of up to 25 tons. Kolcum, *Titan 4 Matures: Air Force, Contractors Predict Long Life for Heavy-Lift Vehicle*, AVIATION WEEK & SPACE TECH., July 17, 1989, at 34. Orbiting research platforms are even larger than most satellites. For instance, NASA's *Skylab*, which crashed into Australia on July 12, 1979, weighed 77.5 tons. See *Skylab's Spectacular Death*, TIME, July 23, 1979, at 35, 35.

15. Congressional findings regarding the importance of the United States commercial launch industry emphasize the goals of assuring "access to space for Government and commercial users," and continuing the United States' "aerospace preeminence." The Commercial Space Launch Act Amendments of 1988, 49 U.S.C. §§ 2601-2623 (1988) [hereinafter Launch Amendments]. The "overriding need to develop space resources as quickly as

trepreneurial creativity necessary to further the development of outer space. Moreover, the federal government's policies of fostering the emergence of a private space launch industry and discouraging reliance on the space shuttle would be frustrated.¹⁶ Maintaining a liability structure that will not subject entrepreneurs to excessive damages is therefore essential to encourage future commercial space launches.

Private organizations striving to develop outer space¹⁷ will face potential tort liability in both the domestic and international realms. Relevant United States domestic law currently consists of federal regulations and common law tort theory, while liability under international law is established primarily through several treaties.¹⁸ In addition, organizations may be subject to the various tort laws of any foreign nation in which their malfunctioning space vehicles cause damage. Companies also may be liable where such vehicles harm the citizens or nationals of foreign countries.¹⁹ The various United States domestic tort theories which could apply include strict liability for an abnormally dangerous activity, negligence, and *res ipsa loquitur*.²⁰ Therefore, a corporation must scrutinize both domestic law and international treaties to determine the full scope of its liability for outer space ventures.

This note begins with an analysis of the current legal framework applicable to commercial enterprises seeking advancement in outer space. First, it describes the extent of United States domestic liability as provided by recent federal legislation.²¹ This discus-

possible" is similar to the need that existed during the "development of the railroads during the nineteenth century, [and] the United States shipping industry before the Civil War

" G. REYNOLDS & R. MERGES, *OUTER SPACE: PROBLEMS OF LAW AND POLICY* 268 (1989).

16. See HOUSE COMM. ON SCIENCE, SPACE, AND TECHNOLOGY, *COMMERCIAL SPACE LAUNCH AMENDMENTS OF 1988*, H.R. REP. NO. 639, 100th Cong., 2d Sess. 3 (1988).

17. McDonnell Douglas, General Dynamics, and Martin Marietta have joined this pursuit. Egan, *For Sale: Commercial Space*, *AD ASTRA*, Dec. 1989, at 9, 11.

18. Note, *The Case For a Federal Common Law of Space*, *N.Y.L. SCH. L. REV.* 509, 511 (1988).

19. Under the *lex loci delicti* principle, a court will apply the law of the place of the forum. See *Paoletto v. Beech Aircraft Corp.*, 464 F.2d 976, 979 n.7 (3d Cir. 1972); *Raymark Indus., Inc. v. Stemple*, 714 F. Supp. 460, 465 (D. Kan. 1988); *RESTATEMENT OF CONFLICT OF LAWS* § 378 (1934). This note does not discuss liability under the current domestic laws of foreign countries because of the prohibitive number and variety of such laws.

20. See generally *Bosco, Manufacturer Liability to Third Parties for Outer Space Activities*, 7 *NORTHROP U.L.J.* 1, 30-51 (1986) (discussing, at length, the various substantive bases for recovery).

21. See *infra* text accompanying notes 24-83.

glehold" on commercial satellite launches because its experience and prices could not be matched.³⁸ Internationally, American private enterprise had to compete with foreign launch agencies, the most significant of which was Arianespace. This French company launched nearly fifty percent of the world's commercial satellites in 1985.³⁹ Other countries were beginning to develop and market their own launch services as well,⁴⁰ resulting in more competition from governmentally subsidized organizations.

After the *Challenger* accident,⁴¹ the United States recognized the value of increasing its support for the private space industry. In the wake of this accident, the federal government decided to adopt new policies for government launches. First, NASA was restricted to launching government payloads.⁴² This action forced all of NASA's commercial customers to find alternative means of obtaining access to outer space.⁴³ Second, the government decided to use expendable launch vehicles ("ELVs")⁴⁴ as an alternative means of boosting satellites, rather than relying exclusively on the space shuttle.⁴⁵ This action eliminated the surplus launch equip-

reprinted in 1988 U.S. CODE CONG. & ADMIN. NEWS 5525, 5526.

38. Straubel, *supra* note 26, at 942 (citing The Center of Space Policy, Inc., Commercial Space Industry In the Year 2000: A Market Forecast (June 1985) (unpublished manuscript unavailable to the public)).

39. H.R. REP. NO. 639, *supra* note 16, at 5. It should also be noted that "[t]he French Government and the European Space Agency indemnify Arianespace for third party losses [sic] in excess of \$70 million," thus making competition in the world market even more difficult. Gorove, *The Commercial Space Launch Act Amendments of 1988: A Brief Overview*, 16 J. SPACE L. 184, 185 (1988).

40. The Soviet Union is marketing its Proton, China is developing the Long March system, and Japan is developing the H-2. See *Liability Hearings*, *supra* note 27, at 2.

41. See *supra* note 12.

42. On August 15, 1986, President Reagan announced, "NASA will no longer be in the business of launching private satellites. Instead, NASA and the four shuttles should be dedicated to payloads important to national security and foreign policy, and even more, on exploration, pioneering and developing new technologies and uses of space." Foley, *Reagan Bars Shuttle from Competing for New Satellite Launch Contracts*, AVIATION WEEK & SPACE TECH., Aug. 25, 1986, at 22, 22.

43. At the time of this order, forty-four companies held launch service or letter agreements for space shuttle satellite launches. "The damages to these companies have in most cases exceeded \$100 million on an individual basis, as a result of such expenses as non-usable Shuttle-unique hardware, software, equipment and documentation" H.R. REP. NO. 639, *supra* note 16, at 7.

44. Expendable launch vehicles are rocket boosters that, unlike the space shuttle, can be used only once. The ELVs used extensively by the United States are the Delta, Atlas, and Titan boosters. These boosters come in a variety of models and "strap-on" solid-fuel booster configurations. See generally K. GATLAND, THE ILLUSTRATED ENCYCLOPEDIA OF SPACE TECHNOLOGY 57 (1981) (describing rockets used by different countries).

45. See *Liability Hearings*, *supra* note 27, at 9 (statement of Thomas S. Moorman,

ment which the Launch Act had originally made available to private industry.⁴⁶ Essentially, foreign competition, combined with the federal monopoly on launch facilities, threatened to frustrate the new policy of advancing commercial enterprise in outer space.

B. The 1988 Amendments to the Commercial Space Launch Act

In response to the needs of the private space industry, Congress passed the Commercial Space Launch Act Amendments of 1988.⁴⁷ This legislation was designed to "encourage, facilitate and promote the use of the United States commercial space launch industry in order to continue United States aerospace preeminence."⁴⁸ The Senate Committee on Commerce, Science, and Transportation presented the following summary of the Launch Amendments:

The purposes of the [legislation] are: to amend the Commercial Space Launch Act; to provide interim transitional support; to ensure the successful development of a competitive domestic expendable launch vehicle (ELV) industry; to apportion launch liability risks between the domestic commercial space launch industry and the U.S. Government; to provide incentives for certain satellites that were removed by a Presidential directive from the space shuttle manifest to launch on domestic ELV's; to establish protections against Government pre-emption of commercial launches on Government ranges; and to recommend the formulation of international "rules of the road" as regards the conduct and pricing of commercial space launch activities.⁴⁹

The Launch Amendments include several provisions that affect a licensee's liability to third parties. First, section 2603(11) of the Launch Amendments provides a limiting definition of "third party":

- (11) 'third party' means any person or entity other than —
- (A) the United States, its agencies, or its contractors or subcontractors involved in launch services;
 - (B) the licensee or transferee;
 - (C) the licensee's or transferee's contractors, subcontractors,

Director of Space and SDI Programs, Office of the Assistant Secretary of the Air Force — Acquisition) (discussing the decision to "revitalize" the ELV programs).

46. *Id.*

47. Pub. L. 100-657, 102 Stat. 3900 (codified at 49 U.S.C. § 2601-2623 (1988)).

48. Launch Amendments, *supra* note 16, at 3900.

49. S. REP. No. 593, *supra* note 37, at 1.

tors, or customers involved in launch services; or

(D) any such customer's contractors or subcontractors involved in launch services⁵⁰

This definition explicitly excludes government employees and contractors as third parties. It also excludes any private employees and contractors who are involved directly with the actual launch of a vehicle. These exclusions are important, because severe injury and property damage are most likely to occur on or near the launch facility during the actual launch.⁵¹ The Launch Amendments' provisions limiting liability for third party injuries⁵² do not apply to this high-risk group.

Section 2615 of the Launch Amendments outlines the liability insurance requirements of a licensee. These include limits on insurance coverage, reciprocal waivers of claims among the launch services organizations, indemnity by the federal government for third party claims exceeding the required amount of insurance coverage, and various options available to the Secretary of Transportation.⁵³

The first requirement ensures that a licensee has adequate financial resources. It provides that an organization must either obtain liability insurance up to a determinable minimum amount or otherwise demonstrate adequate financial responsibility prior to receiving a license for a particular launch.⁵⁴ For each launch, the Secretary of Transportation is responsible for determining the minimum amount of insurance or other financial resources a licensee must possess. This determination is based on the "maximum probable loss from claims by a third party for death, bodily injury, or loss of or damage to property resulting from activities carried out under the license"⁵⁵ However, for any particular

50. 49 U.S.C. § 2603(11) (1988).

51. Catastrophic failures of space vehicles have generally occurred at or soon after lift-off. For instance, in April 1986 a Titan 34D exploded only 700 feet above the launch pad. "[L]arge solid rocket motor segments, payload, and core booster sections impact[ed] among the major launch pad structures." *Liability Hearings*, *supra* note 27, at 13. No major fragments of the Titan hit the fully manned Launch Service Building, which is within 500 yards of the launch pad. *Id.* at 12. Total damage resulting from this accident was \$58.1 million. *Id.*

52. See *infra* text accompanying notes 61-63.

53. 49 U.S.C. § 2615 (1988).

54. *Id.* § 2615(a)(1)(A).

55. *Id.* Requiring insurance protects potential third party claimants and assists the federal government. Specifically, the United States "remains strictly liable for any damages to foreign states or nationals caused by satellite launch operations pursuant to [inter-

launch, a licensee is only required to obtain insurance equalling the lesser of \$500 million or "the maximum liability insurance available on the world market at a reasonable cost."⁵⁶ This provision effectively places a \$500 million cap on a licensee's liability for damages to third parties. In a particular accident, aggregate damages awarded to third parties in excess of the \$500 million insurance maximum will be paid by the federal government.⁵⁷

The Launch Amendments similarly place a \$100 million cap on the liability insurance required of licensees for claims made by the United States for "loss of or damage to property of the United States resulting from activities carried out under the license in connection with any particular launch."⁵⁸ This insurance requirement protects government personnel and facilities. As previously noted, catastrophic damage is most likely to occur in the early stages of a launch.⁵⁹ The risk to government resources is more easily determined than the risk to the general public because the full extent of damage to the isolated launch area is more foreseeable.⁶⁰ It is therefore reasonable to distinguish between the potential claimants.

The liability insurance section of the Launch Amendments also requires reciprocal waivers of claims between the licensee and (1) "its contractors, subcontractors, and customers, and the contractors and subcontractors of such customers,"⁶¹ and (2) the Secretary of Transportation, representing "the United States, its agencies involved in launch services, and contractors and subcontractors involved in launch services."⁶² Essentially, the licensee and any other organization assisting in the actual launch will be immune from the other's claims. Therefore, by agreement, the licensee's insurance will cover losses incurred by any of these organizations during the launch operation, regardless of fault.

national agreements]." S. REP. NO. 593, *supra* note 37, at 9. The required insurance, therefore, provides a means of compensation available to injured foreign third parties. For further discussion of international responsibilities in this area, see *infra* text accompanying notes 84-156.

56. 49 U.S.C. § 2615(a)(1)(A).

57. *Id.* § 2615(b)(1). However, the government will pay no more than \$1.5 billion. *Id.*, see *infra* notes 63-65 and accompanying text.

58. 49 U.S.C. § 2615(a)(1)(B) (1988).

59. See *supra* note 51 and accompanying text.

60. The full value of each launch pad is known and, in the event of commercial use of a government launch facility, will be taken into consideration for insurance purposes.

61. 49 U.S.C. § 2615(a)(1)(C).

62. *Id.* § 2615(a)(1)(D).

sion includes the effects of domestic liability on private space launch companies and insurance companies. Next, it briefly examines the extent of liability under existing international law.²² Finally, this note proposes to limit private organizations' exposure to third party liability by refining domestic regulations and international agreements.²³ To accomplish this, the federal government should provide a specific and exclusive cause of action for injured local and foreign third parties. This note also proposes a cap on damage awards. These proposed federal actions would help domestic private enterprise succeed in the international space launch market.

I. DOMESTIC LAW GOVERNING PRIVATE SPACE LAUNCHES

A. The Commercial Space Launch Act of 1984

Congress enacted the Commercial Space Launch Act of 1984 ("Launch Act")²⁴ to stimulate private investment in commercial, unmanned space vehicles by creating opportunities for organizations to launch commercial and other private satellites.²⁵ The Launch Act authorizes the United States, under the auspices of the Office of Commercial Space Transportation ("OCST"),²⁶ to "license launches by U.S. citizens from foreign as well as domestic sites, to review payloads not under the authority of other agencies, and to license commercial launch sites."²⁷

The Launch Act has several provisions pertaining to the potential liability faced by the private space industry.²⁸ The Act essentially prohibits the launch of any space vehicle from United

22. See *infra* text accompanying notes 84-156.

23. See *infra* text accompanying notes 157-235.

24. Pub. L. No. 98-575, 98 Stat. 3055 (1984).

25. 49 U.S.C. § 2602 (1988).

26. See Straubel, *The Commercial Space Launch Act: The Regulation of Private Space Transportation*, 52 J. AIR L. & COM. 941, 953 (1987) (although the OCST has been operating informally since 1983, it has since been officially delegated responsibility for administering the Launch Act); Comment, *supra* note 1, at 110 (the commercial launch industry is "regulated by the Department of Transportation's Office of Commercial Space Transportation").

27. *Commercial Expendable Launch Vehicle Liability: Hearing before the Subcomm. on Science, Technology, and Space of the Committee on Commerce, Science, and Transportation, United States Senate*, 100 Cong., 2d Sess. 19 (1988) [hereinafter *Liability Hearings*] (statement of Courtney A. Stadd, Director, OCST).

28. For a more extensive analysis of the Launch Act, see Straubel, *supra* note 26, at 950-65; Comment, *supra* note 1, at 110-15.

States territory or by a "United States citizen"²⁹ unless OCST has issued a license permitting the activity.³⁰ OCST will issue a license only after the applicant obtains the requisite safety and mission approvals.³¹ The safety approval focuses on the actual launch of the vehicle and is a simple process if the applicant intends to use a federally operated range or launch facility.³² The mission approval, which includes interaction with other federal agencies, focuses on the payload.³³ The purpose of this review process is to "ensure that a proposed launch and any accompanying payloads do not endanger public safety."³⁴

The Launch Act was "a good start for the development of a viable private launch industry in the United States [because it] create[d] the framework for developing a workable regulating bureaucracy."³⁵ However, the Act still had basic problems.³⁶ Essentially, the Act did not create an environment in which private industry could compete successfully within the domestic or international marketplace.³⁷ Domestically, NASA had a "stran-

29. The Launch Act defines "United States citizen" as:

(A) any individual who is a citizen of the United States;

(B) any corporation, partnership, joint venture, association, or other entity organized or existing under the laws of the United States or any State; and

(C) any corporation, partnership, joint venture, association, or other entity which is organized or exists under the laws of a foreign nation, if the controlling interest is held by an individual or entity described in subparagraph (A) or (B).

49 U.S.C. § 2603(12) (1988).

30. See *id.* § 2605(a). The licensing regulations are published in their entirety in Commercial Space Transportation: Licensing Regulations, 14 C.F.R. §§ 400-499 (1988) ("These regulations set forth the procedures and requirements applicable to the authorization of all space launch activities.").

31. Straubel, *supra* note 26, at 955 (citing 51 Fed. Reg. 6870, 6875 (1986) (codified at 14 C.F.R. § 415.5 (1990))).

32. *Id.* There is a "presumption of safety afforded federal ranges and [previously] licensed private sites," while new sites face a "long and complicated" safety review. *Id.* at 955, 957. See generally Boehler, *supra* note 2, at 40 (Space Services had to follow a "paper trail through some 18 government agencies" to launch its first Conestoga One rocket).

33. Straubel, *supra* note 26, at 958. For example, OCST must consult the Department of State for foreign policy considerations and the Department of Defense for national security considerations regarding each proposed payload. *Id.*

34. *Id.* at 955.

35. *Id.* at 965.

36. Straubel recommends specific steps which, if taken, would improve the effectiveness of the Launch Act. Included among the recommendations are establishment of minimum safety standards, incentives for development of private space transportation, and streamlining the regulatory system. *Id.* at 965-67.

37. SENATE COMM. ON COMMERCE, SCIENCE, AND TRANSPORTATION, COMMERCIAL SPACE LAUNCH ACT AMENDMENTS OF 1988, S. REP. NO. 593, 100th Cong., 2d Sess. 2,

The most significant section of the Amendments provides that the United States will pay any "successful claims of a third party against the licensee," resulting from the licensee's space launch activities, "for death, bodily injury, or loss of or damage to property" ⁶³ if "the aggregate of claims arising out of any particular launch: (A) is in excess of the amount of insurance or demonstration of financial responsibilities required and (B) is not in excess of the level that is \$1,500,000,000 above such amount." ⁶⁴ Thus, the federal government will pay any successful damage claims by third parties totaling more than \$500 million and less than \$2 billion. Any claims for more than \$2 billion will be the full responsibility of the licensee. The only exception to federal coverage of excess claims is for injuries or damages resulting from the "willful misconduct" of the licensee. ⁶⁵

The Launch Amendments also establish prerequisites for payment by the United States. The government requires notice of any claim arising from a particular launch agreement, the opportunity to participate in the defense of a licensee, and approval of the Secretary of Transportation for payment from appropriated funds. ⁶⁶ "The purpose of these conditions is to ensure that the United States is fully aware and involved in litigation or proceedings which [may] lead to the disposition of claims against licensees." ⁶⁷

In addition, the Secretary is authorized to withhold payment upon determining that a claim is "not just and reasonable." ⁶⁸ This provision applies to out-of-court settlements negotiated among the interested parties, with or without governmental involvement. ⁶⁹ All "final judgment[s] of a court of competent jurisdiction," must be considered "just and reasonable." ⁷⁰ Although the term "court of competent jurisdiction" has not been defined, the apparent intent of Congress is to honor any judgment rendered pursuant to a

63. *Id.* § 2615(b)(1). This payment would include any "reasonable expenses of litigation or settlement." *Id.*

64. *Id.*

65. *Id.*

66. *See id.* § 2615(b)(2). What constitutes "notice" to the federal government is not clear from the text or history of the legislation. Presumably, the licensee is required to notify the government immediately upon learning of claims against it in order to ensure indemnity of any damage award above the limits of its insurance coverage.

67. S. REP. NO. 593, *supra* note 37, at 18.

68. 49 U.S.C. § 2615(b)(3) (1988).

69. *See* S. REP. NO. 593, *supra* note 37, at 19.

70. 49 U.S.C. § 2615(b)(3).

judicial proceeding in which the government had an opportunity to participate.⁷¹

C. Practicality and Application of Domestic Law

Overall, the Launch Amendments provide an excellent legal foundation on which to build a commercially successful private space enterprise. By separating launch services personnel from potential third party litigants, licensees are able to group the most unpredictable risks into a single category covered by a separate insurance policy. Therefore, the insurance policy may be adjusted as data is gathered concerning the initial ascent portion of a particular company's launches, a period of the launch that threatens only launch facility personnel. Likewise, third party liability insurance may be adjusted to match the perceived risks presented by down-range and orbital aspects of a particular satellite launch.⁷²

The cap on liability insurance also provides a significant incentive for development of the private space industry. By specifying a limit on insurance, licensees have a firm monetary figure to use for planning and pricing space launches. As a result, the licensee will not have to "bet the company" every time it proceeds with a launch.⁷³ Furthermore, the public is likely to accept the Launch Amendments' insurance cap because the federal government agrees only to share liability for harm to third parties.⁷⁴

Critics contend that the \$100 million limit on a licensee's in-

71. See S. REP. NO. 593, *supra* note 37, at 18-22 (discussing the conditions for government payment of damage claims).

72. Down-range injury to third parties is unlikely because both of the United States' primary launch facilities, the Eastern Test Range at Cape Canaveral, Florida, and the Western Test Range at Vandenberg Air Force Base, California, are relatively isolated from populated areas and are adjacent to oceans. The remaining possibility of third party risk is the uncontrolled reentry of an orbiting satellite. One source estimates that 7,000 trackable objects (satellites and miscellaneous debris) are currently in earth's orbit. Baker, *Space Debris: Law and Policy in the United States*, 60 U. COLO. L. REV. 8, 55 (1989).

73. See *State of the Commercial Launch Industry: Hearings Before the Subcomm. on Space Science and Applications of the House Comm. on Science and Technology*, 100th Cong., 1st Sess. 355 (1987) (statement of John F. Yardley, President, McDonnell Douglas Astronautics Co.) (discussing the risk assumed by private launch enterprises due to the limitations on or nonavailability of liability insurance).

74. See Comment, *supra* note 1, at 141 (an insurance cap of the type included in the Launch Amendments is "not the first time the Government has shared third party liability risks with industry."). Prior statutory liability caps have been upheld as constitutional even without governmental indemnification. See, e.g., *Duke Power Co. v. Carolina Envtl. Study Group*, 438 U.S. 59 (1978) (upholding statutory cap on a nuclear power utility's liability).

insurance protecting government property is inadequate for complex and expensive launch facilities like those used by the Titan programs.⁷⁵ This argument is of questionable validity because the worst accident involving a Titan booster caused the government \$60 million in property damage.⁷⁶ Although a more severe accident is conceivable, the \$100 million insurance limit is adequate, especially considering that the privately obtained insurance will provide "a form of protection for loss or damage to Government property that never before has been available in launch operations."⁷⁷

The \$500 million cap on liability insurance for third party protection also has been criticized, primarily because it discourages the purchase of additional insurance coverage available at reasonable rates.⁷⁸ This could harm licensees, who are responsible for paying damages exceeding the \$2 billion governmental limit. Furthermore, the insurance cap may interfere with the world insurance market. In fact, representatives of the insurance industry have recommended replacing the \$500 million limit for third party liability with an upper limit of the maximum liability insurance reasonably available on the world market.⁷⁹ As long as the price is reasonable, the licensee would not be adversely affected. Although these arguments have merit, they enrich the insurance industry at the expense of the space industry because of the uncer-

75. See *Liability Hearings*, *supra* note 27, at 10-11 (statement of Thomas S. Moorman, Jr., Director of Space and SDI Programs, Office of the Assistant Secretary of the Air Force — Acquisitions) (the \$100 million limit is inadequate for certain launch pads, including the Titan facility, valued in excess of \$300 million); *cf. id.* at 23-24 (statement of OCST Director Stadd concerning the advantages of the Launch Amendments' insurance requirement).

76. See S. REP. NO. 593, *supra* note 37, at 12 (discussing the rationale for the \$100 million limitation).

77. *Id.* Therefore, the contractual arrangement provided by the Launch Amendments benefits both parties. The government is protected against foreseeable damage to its launch pad by the licensee's insurance, while the licensee is protected against unforeseeable loss by the government's assumption of that risk. *Liability Hearings*, *supra* note 27, at 23-24 (statement of OCST Director Stadd).

78. The insurance industry has argued:

A statutory cap on private insurance can be viewed by underwriters as a disincentive to optimize insurance capacity in support of the U.S. commercial launch industry. Further, such a cap would directly conflict with the well-established policy that any Government indemnity should not compete with the activities of private insurers.

Liability Hearings, *supra* note 27, at 78 (statement of James W. Barrett, President, International Technology Underwriters).

79. *Id.*

tainty about what constitutes the maximum amount "reasonably available."

Congress established the \$500 million insurance limit after careful consideration of the insurance and space launch industries. The figure of \$500 million was chosen because it is the amount of liability required by NASA for payloads carried by the space shuttle.⁸⁰ No past claims have exceeded \$500 million.⁸¹ The limited insurance requirement reduces the exposure of private spacecraft launchers to the unpredictable insurance market. In other words, the cost of available insurance varies with the success or failure of past launches.⁸² By limiting the amount of insurance required, Congress is actually keeping the insurance companies from overextending themselves. Therefore, a single, catastrophic accident will probably not "overwhelm the capacity of the marketplace or the ability of a launch operator to pay the premiums that may be charged" for future launches.⁸³

II. INTERNATIONAL LAW GOVERNING SPACE LAUNCHES

A. Treaties

The international law governing the United States' outer space activities consists of four multinational treaties⁸⁴ and "customary space law."⁸⁵ The treaties are the Outer Space Treaty,⁸⁶

80. See S. REP. NO. 593, *supra* note 37, at 10.

81. *Id.*

82. In 1983, a successful year for United States space programs, underwriters realized a 10% profit. In 1984, however, underwriters suffered an 80% loss following a series of unsuccessful launches. *Id.* at 4. Because of the volatility of the spacecraft insurance market, premiums have increased from 5-7% of a satellite's value for a launch in 1983 to as much as 30% of a satellite's value. *Id.* at 9.

83. *Id.* at 10. It is important to note that space launch entrepreneurs purchase forms of insurance other than liability insurance for each launch. For instance, a Titan III carrying two satellites may require \$250 million in property insurance for the satellites in addition to the \$500 million third party liability insurance and the \$100 million government property insurance. Therefore, the total insurance coverage for this particular booster would be \$850 million. *Id.* This is especially overwhelming if other major launches take place soon before or after the Titan launch.

84. A fifth treaty, the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, opened for signature Dec. 18, 1979, 18 I.L.M. 1434, has not been ratified by the United States because of ambiguous legal and political terminology. See *Space Law: The "Big Five,"* BARRISTER, Winter 1988, at 30, 30. Prior to the ratification of these treaties, nations had a claim of right or privilege to act in outer space in accordance with customary international law. The limits of their actions would be determined largely by the reactions of other nations. See H. STEINER & D. VAGTS, *TRANSNATIONAL LEGAL PROBLEMS* 300 (3d ed. 1986).

85. See M. McDUGAL, H. LASSWELL & I. VLASIC, *LAW AND PUBLIC ORDER IN*

the Rescue and Return Agreement,⁸⁷ the Liability Convention,⁸⁸ and the Registration Convention.⁸⁹ Customary space law is "a process of accumulation and stabilization of patterns of uniformities" occurring in the legal relations among nations interested in exploring outer space.⁹⁰ Essentially, customary space law, which recognizes equal rights of access to outer space, evolved from the international response to the first space launches.⁹¹ Although customary space law still exists, it now serves primarily as background to the four treaties. This note will consider only two of the treaties, the Outer Space Treaty and the Liability Convention, because they expressly address issues of third party liability in the international context.

The Outer Space Treaty, which has been referred to as the "Magna Charta for the exploration and use of outer space,"⁹² is the "main base for the legal order of the space environment."⁹³ The stated purpose of this treaty is to "contribute to broad inter-

SPACE 105 (1969) (discussing origins and development of customary space law).

86. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty] (declaring outer space free from claims of national sovereignty and limiting signatories to peaceful use thereof).

87. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched in Outer Space, Apr. 22, 1968, 19 U.S.T. 7572, T.I.A.S. No. 6599, 672 U.N.T.S. 119 (mandating assistance in recovery and return of foreign astronauts and spacecraft).

88. Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 2392, T.I.A.S. No. 7762, at 4, 961 U.N.T.S. 187, 189 [hereinafter Liability Convention] (assigning responsibility to launching nation for damages caused by its spacecraft).

89. Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, T.I.A.S. No. 8480, 1023 U.N.T.S. 15 (requires the registration of all spacecraft with the United Nations). For a discussion of all four treaties, see Note, *The Case for a Federal Common Law of Space*, 33 N.Y.L. SCH. L. REV. 509, 516-20 (1988).

90. M. McDUGAL, H. LASSWELL & I. VLASIC, *supra* note 85, at 105.

91. Since the first Sputnik launch in October 1957,

"numerous earth-orbiting satellites have repeatedly passed over the land and territorial waters of every nation on earth. No permission was sought in advance by the launching State, none was expressly given by any State, and not a single protest has been registered by any State. The only conclusion that may reasonably be drawn is that nations have not regarded territorial sovereignty as extending as high as the point at which the orbiting of these satellites has occurred."

Id. at 200 n.7 (quoting Johnson, *The Future of Manned Space Flight, and the Freedom of Outer Space*, NASA News Release No. 61-53, at 5-6 (Aug. 4, 1962)).

92. Baker, *supra* note 72, at 70 n.91.

93. C. CHRISTOL, *THE MODERN INTERNATIONAL LAW OF OUTER SPACE* 20 (1982).

national co-operation in the scientific as well as the legal aspects of the exploration and use of outer space for peaceful purposes."⁹⁴ The relevant provisions of this treaty are included in articles VI and VII. Article VI provides: "States Parties to the Treaty shall bear international responsibility for national activities in outer space whether such activities are carried on by governmental agencies or by non-governmental entities"⁹⁵ Article VII provides: "[E]ach State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space"⁹⁶

The Outer Space Treaty provides only a general framework from which to develop and build international space law. Article VI simply places responsibility for all national outer space activities on the respective government, even when the actual launch is accomplished by a private organization. This provision effectively prevents unregulated or unsupervised private launches.⁹⁷ Therefore, the United States is ultimately responsible for the international consequences of private American space launches. This responsibility accounts for the complex federal licensing process presently imposed upon private launching agencies.⁹⁸

Similarly, Article VII of the Outer Space Treaty was included only to establish the "general principle" that a launching State is liable for damages or injuries caused to other countries and their nationals.⁹⁹ The wording was purposely left "very brief

94. Outer Space Treaty, *supra* note 86, preamble, 18 U.S.T. at 2411, T.I.A.S. No. 6347, at 1, 610 U.N.T.S. at 207. The treaty "provides limits on military activities beyond earth, prevents the extension of terrestrial sovereignty to space or celestial bodies, and establishes a framework for the further development of law governing activity in outer space." G. REYNOLDS & R. MERGES, *supra* note 15, at 62.

95. Outer Space Treaty, *supra* note 86, art. VI, 18 U.S.T. at 2415, T.I.A.S. No. 6347, at 6, 610 U.N.T.S. at 209.

96. *Id.* art. VII, 18 U.S.T. at 2415, T.I.A.S. No. 6347, at 6, 610 U.N.T.S. at 209.

97. See E. VAN BOGAERT, ASPECTS OF SPACE LAW 44 (1986). Article VI "assures that the parties cannot escape their international obligations by virtue of the fact that activity in outer space is conducted through the medium of nongovernmental entities." G. REYNOLDS & R. MERGES, *supra* note 15, at 74.

98. The Secretary of Transportation approves and issues licenses to private launching organizations in accordance with the provisions set forth by 49 U.S.C. §§ 2605-2609 (1988).

99. This provision does not apply to injuries occurring to nationals of the launching state. This conforms to traditional international law, which holds that the relationship between a state and its citizens is governed by that state's law. E. VAN BOGAERT, *supra* note

and simple" because "[a]ny additional details might [have dealt] too rapidly with problems which had not yet been settled."¹⁰⁰ For instance, the parties used the term "internationally liable"¹⁰¹ because they could not agree on specific terms for absolute liability.¹⁰² The issue was left for resolution by future international agreements and customary space law development.

The 1972 Liability Convention expands the basic international liability concepts set forth in the 1967 Outer Space Treaty. The Liability Convention adds more efficient legal provisions and definitions, including several dealing with the liability of private organizations to foreign third parties.

First, the Liability Convention defines "damage" as "loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical."¹⁰³ The precise meaning of "damage" is not readily apparent from this definition. For instance, the words "loss of life, personal injury or impairment of health" have been interpreted to include "not only physical injury but also injury affecting mental as well as social well-being."¹⁰⁴ Additional debate focuses on whether physical manifestation of mental harm is required for financial recovery.¹⁰⁵

The intention of the parties to the Liability Convention was to limit recoverable damages to those resulting directly from the

96, at 163-64.

100. Dembling & Arons, *The Evolution of the Outer Space Treaty*, 33 J. AIR L. & COM. 419, 438 (1967).

101. Outer Space Treaty, *supra* note 86, art. VII, 18 U.S.T. at 2415, T.I.A.S. No. 6347, at 6, 610 U.N.T.S. at 209.

102. See G. REYNOLDS & R. MERGES, *supra* note 15, at 75.

103. Liability Convention, *supra* note 88, art. I(a), 24 U.S.T. at 2392, T.I.A.S. No. 7762, at 4, 961 U.N.T.S. at 189.

104. See S. GOROVE, *STUDIES IN SPACE LAW: ITS CHALLENGE AND PROSPECTS* 124 (1977). Gorove supports his interpretation by drawing on the World Health Organization's definition of "health": "[A] state of complete physical, mental and social well-being." *Id.* at 125 (quoting the Preamble to the Constitution of the World Health Organization, *reprinted in Final Acts of the International Health Conference*, U.N. Doc. E/155, at 11 (1946)).

105. See Bosco, *Practical Analysis of International Third Party Liability for Outer Space Activities - A U.S. Perspective*, 29 TRIAL LAW GUIDE 298, 340 (1985) (arguing that recovery of "lost profits, loss of earning capacity, interest, sentimental value, and pain and suffering" is uncertain under the treaty). *But see* Foster, *The Convention on International Liability for Damage Caused by Space Objects*, 10 CAN. Y.B. 137, 155 (1972) (arguing that it "is clear that all injuries to persons are covered whether or not they are accompanied by objective or substantially harmful physical or psychopathological consequences").

outer space activity¹⁰⁶ Specifically, "remote or indirect damage for which there is only a hypothetical causal connection with a particular space activity" is not covered by the provisions of the convention.¹⁰⁷ In light of this intention, parties to the treaty disagreed sharply about the treatment of radiation and radioactive fallout damage caused by a malfunctioning nuclear powered satellite.¹⁰⁸ Eventually, however, the parties signed the agreement with the understanding that such damage, even if it were not discovered until years after an accident, would be covered by the Liability Convention.¹⁰⁹

Without further modification of the international agreement, the exact definition of damages will be determined during actual claim disputes. "Unquestionably, in the field of space tort law, the issue of damages will by far be the most disputed."¹¹⁰

Second, the treaty provides that a launching state that is also responsible for the activities of its private agencies "shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight."¹¹¹ This provision clearly holds a state liable for all damages inflicted by a private launch agency regardless of fault. The imposition of absolute liability is justified because "the state for whose benefit the risk was created should bear the loss unavoidably entailed in space activities rather than the random victim."¹¹²

Third, the Liability Convention outlines methods of claim presentation and resolution. Presentation of any claim made against the launching state under the terms of this convention must be made through the state that suffered injury, or whose nat-

106. S. GOROVE, *supra* note 104, at 125 n.8 (A launching state is only liable for damages "traceable directly to the launching, flight and re-entry of a space object or associated launch vehicle.") (quoting STAFF OF SENATE COMM. ON AERONAUTICAL AND SPACE SCIENCES, 92D CONG., 2D SESS., REPORT ON CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGE CAUSED BY SPACE OBJECTS 24 (Comm. Print 1972)).

107. *Id.*

108. "[T]he Soviet Union and the delegations from Eastern Europe defended the opinion that nuclear damage should be the object of a separate convention or that it could be regulated by an amendment to the Vienna Convention of 1963 on Liability for Nuclear Damage." E. VAN BOGAERT, *supra* note 97, at 172. Other parties felt the Liability Convention would be incomplete without the inclusion of radiation damages. *Id.*

109. *Id.* at 173.

110. Bosco, *supra* note 105, at 332.

111. Liability Convention, *supra* note 88, art. II, 24 U.S.T. at 2392, T.I.A.S. No. 7762, at 4, 961 U.N.T.S. at 189.

112. Foster, *supra* note 105, at 151.

ural or juridical persons suffered injury,¹¹³ within one year of its occurrence.¹¹⁴ However, if the state of nationality fails to make a claim, the state in which the injury occurred may present a claim on behalf of any person "in respect of damage sustained in its territory"¹¹⁵ Furthermore, if neither of the previously mentioned States presents a claim, the State of an injured party's permanent residence may present a claim "in respect of damage sustained by its permanent residents."¹¹⁶ These provisions apparently permit an injured party to petition up to three different countries to present a claim on its behalf. However, "it is not clear when the period that a State of nationality [or state of injury] has for presenting a claim will be finished. Furthermore, this article does not require an applicant state to ascertain whether or not the state of nationality intended to present the claim."¹¹⁷

Settlement of a claim must be sought first through diplomatic channels between the claimant state and the launching state.¹¹⁸ If no settlement is reached within one year, the parties must establish a Claims Commission¹¹⁹ consisting of a three member board chosen by the parties.¹²⁰ The Claims Commission must render a decision within one year of its formation.¹²¹

The recovery scheme presented by the Liability Convention guarantees expeditious adjudication because a decision must be rendered, either diplomatically or through the Claims Commission, within two years after the claim is made.¹²² Furthermore, a claimant is "assured of seeking redress from an entity which is capable of providing full compensation."¹²³ However, there is

113. Liability Convention, *supra* note 88, art. VIII(1), 24 U.S.T. at 2395, T.I.A.S. No. 7762, at 7, 961 U.N.T.S. at 191.

114. *Id.* art. X, at 2396, T.I.A.S. No. 7762, at 8, 961 U.N.T.S. at 191.

115. *Id.* art. VIII(2), at 2395, T.I.A.S. No. 7762, at 7, 961 U.N.T.S. at 191.

116. *Id.* art. VIII(3), at 2395, T.I.A.S. No. 7762, at 7, 961 U.N.T.S. at 191.

117. Diederiks-Verschoor, *The Convention on International Liability Caused by Space Objects*, in 15 PROCEEDINGS OF THE FIFTEENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 96, 101 (1972) (criticizing the provisions as not "as clear as they should be").

118. Liability Convention, *supra* note 88, art. IX, 24 U.S.T. at 2396, T.I.A.S. No. 7762, at 8, 961 U.N.T.S. at 191.

119. *Id.*, art. XIV, at 2398, T.I.A.S. No. 7762, at 10, 961 U.N.T.S. at 192.

120. *Id.*, art. XV, at 2398, T.I.A.S. No. 7762, at 10, 961 U.N.T.S. at 192.

121. *Id.*, art. XIX(3), at 2400, T.I.A.S. No. 7762, at 12, 961 U.N.T.S. at 193.

122. Two years is the sum of the time allowed for diplomatic resolution provided by article XIV and the time allowed for Claims Commission resolution provided by article XIX(3). See *supra* text accompanying notes 119-21.

123. Bosco, *supra* note 105, at 309.

some question as to the enforceability of any damage awards made by the Claims Commission.¹²⁴

In dual nationality cases, the Liability Convention provides that an injured third party who is a national of the launching state may not seek recovery under the Liability Convention, even if the party is also a national of a foreign country.¹²⁵ This provision is consistent with international rules providing that "[a] State may not afford diplomatic protection to one of its nationals against a State whose nationality such person also possesses."¹²⁶ Furthermore, the Liability Convention may not be used as a means of recovery by foreign nationals participating in the launch of the space vehicle in the launching state.¹²⁷

Fourth, "[p]resentation of a claim to a launching State for compensation for damage shall not require the prior exhaustion of any local remedies which may be available to a claimant."¹²⁸ With this provision, the Liability Convention explicitly provides an exception to the classic international rule that a claimant must first exhaust all attempts at local redress before seeking diplomatic intervention.¹²⁹ Claimants, therefore, benefit because the extensive time periods often associated with complicated international litigation may be avoided.¹³⁰ However, by circumventing the local judicial system, an injured party may forfeit valuable discovery rights, especially if the launching state is the United States.¹³¹ Furthermore, according to the Liability Convention, a claimant may not simultaneously pursue claims in national

124. See Foster, *supra* note 105, at 175 (The Claims Commission, created by article XIV, "cannot be said to lay down an effective procedure at best it assures a claimant state a reasonable prospect of the payment of compensation.").

125. Liability Convention, *supra* note 88, art. VII(a), 24 U.S.T. at 2395, T.I.A.S. No. 7762, at 7, 961 U.N.T.S. at 191.

126. Convention on Certain Questions Relating to the Conflict of Nationality Laws, Apr. 12, 1930, art. 4, 179 L.N.T.S. 89, 101. *But cf.* United States *ex rel.* Merge v. Italy, 22 I.L.R. 443 (Italian-United States Conciliation Commission 1955) (holding that the United States may bring a claim against Italy on behalf of a citizen of both countries).

127. Liability Convention, *supra* note 88, art. VII(b), 24 U.S.T. at 2395, T.I.A.S. No. 7762, at 7, 961 U.N.T.S. at 191.

128. *Id.*, art. XI, at 2397, T.I.A.S. No. 7762, at 9, 961 U.N.T.S. at 191-92.

129. See E. VAN BOGAERT, *supra* note 97, at 181 (citing C. AMERASINGHE, STATE RESPONSIBILITY FOR INJURIES TO ALIENS 171 (1967); T. HAESLER, THE EXHAUSTION OF LOCAL REMEDIES IN THE CASE LAW OF INTERNATIONAL COURTS AND TRIBUNALS 69 (1968)).

130. Foster, *supra* note 105, at 170; see text accompanying notes 118-21.

131. See generally Foster, *supra* note 105, at 172 (describing the procedure under the treaty).

courts and under the terms of the Liability Convention.¹³²

Fifth, the compensation for which the launching state may be held liable "shall be determined in accordance with international law and the principles of justice and equity, in order to restore the person, State or international organisation on whose behalf the claim is presented to the condition which would have existed if the damage had not occurred."¹³³ This provision, considered the "heart of the Convention" by the Legal Sub-Committee Chairman,¹³⁴ is quite vague, but its purpose is to eliminate any inequities which may result from mechanical implementation of a choice-of-law rule.¹³⁵ For instance, Belgium sought to apply the national law of the injured party, France favored adopting the law of the place of injury, and the Soviet Union advocated applying the law of the launching state.¹³⁶ The resulting compromise eliminated all reference to national law. Consequently, diplomatic negotiations and possible arbitration by the Claims Commission will rely on "international custom, as evidence of a general practice accepted as law"¹³⁷ and "general principles of law recognized by civilized nations."¹³⁸

In summary, the treaties establishing liability of launching states for the actions of their governmental and non-governmental agencies are manifestly plaintiff oriented.¹³⁹ They do, however, form a solid working foundation, despite some possible problems, for international cooperation in the development of outer space.¹⁴⁰

132. Liability Convention, *supra* note 88, art. XI, 24 U.S.T. at 2397, T.I.A.S. No. 7762, at 9, 961 U.N.T.S. at 192.

133. *Id.*, art. XII, at 2397, T.I.A.S. No. 7762, at 9, 961 U.N.T.S. at 192.

134. *Recent Treaties and Statutes, Space Law — Convention on Liability — Procedure Established to Enforce Liability for Damage Caused by Space Objects*, 6 VAND. J. TRANSNAT'L L. 262, 267 n.41 (1972) (quoting 26 U.N. GAOR Supp. (No. 20) Comm. on the Peaceful Uses of Outer Space (98th mtg.) at 28, U.N. Doc. A/8420 (1971) (statement of Eugeniusz Wyzner, Legal Sub-Committee Chairman)).

135. See Bosco, *supra* note 105, at 333-39 (discussing potential inequities of rigid choice-of-law rules). For example, after the Union Carbide disaster in Bhopal, India on December 3, 1984, many victims sought recovery in United States courts, where liberal compensation rules were likely to yield large damage awards. *Id.* at 338 n.65.

136. E. VAN BOGAERT, *supra* note 97, at 173.

137. Statute of the International Court of Justice, art. 38(b), June 26, 1945, 59 Stat. 1055, 1060, T.S. No. 993, at 30 (incorporated at U.N. CHARTER art. 92).

138. *Id.* art. 38(c), at 1060, T.S. No. 993, at 30.

139. See Foster, *supra* note 105, at 149-63 (for example, the principle of absolute liability is extended to suits against governments acting in their official capacities, an unusual exception to governmental immunity).

140. *Id.* at 183-84 (concluding that the convention, though limited in application, represents "a step forward in the developments of the legal regulation of space

Fortunately, the international community has had few opportunities to test the agreements.

B. Past Application of International Space Law

Although various satellites, including *Skylab*, have reentered earth's atmosphere,¹⁴¹ the only one which really tested the existing treaties on the issue of damages was the January 24, 1978 reentry of *COSMOS 954*.¹⁴²

COSMOS 954 was a nuclear powered Soviet surveillance satellite that crashed after an uncontrolled reentry into Canada's Northwest Territories.¹⁴³ The satellite reentered after a failed Soviet attempt to raise it into a higher orbit, where it would have remained for hundreds of years.¹⁴⁴ Fortunately, the satellite, which passed over every country in the world at least twice a day,¹⁴⁵ crashed into an uninhabited region of the Canadian wilderness. The satellite spread radioactive debris over an area of

activities").

141. *Skylab* reentered the earth's upper atmosphere over Maine and finally ended its fiery descent in Australia on July 12, 1979. The 77.5 ton craft broke into approximately 500 pieces, including two weighing two tons each. See *Skylab's Spectacular Death*, *supra* note 14, at 35. Other unplanned satellite reentries include two of the United States' nuclear powered System for Nuclear Auxiliary Power ("SNAP") satellites, which fell harmlessly into the ocean after reentering the earth's atmosphere in 1968 and 1970. See M. BENKO, W. DEGRAFF & G. REIJNEN, *SPACE LAW IN THE UNITED NATIONS* 54 (1985); Straubel, *supra* note 13, at 193-94 (discussing safety concerns surrounding the use of nuclear power sources in space, including the potential spread of radioactive material over the earth caused by satellite reentries).

142. See, e.g., Straubel, *supra* note 13, at 204 ("The crash of *COSMOS 954* provided an excellent opportunity to test the utility of the Liability Convention [although] [t]he exact role played by the Liability Convention in settling Canada's claim may never be known."); Note, *Convention on International Liability for Damage Caused by Space Objects: Definition and Determination of Damages After the COSMOS 954 Incident*, 8 *FORDHAM INT'L L.J.* 255, 256 (1985) (the *COSMOS* incident represents the only case invoking the Liability Convention).

In contrast, the *Skylab* reentry caused no international incident. The United States offered financial assistance to Australia, but none was needed because "[n]o injuries — even to a stray kangaroo — were reported." *Skylab's Spectacular Death*, *supra* note 14, at 36. This is particularly fortuitous because *Skylab* passed directly over the coastal city of Esperance, population 9,000, as it broke apart. See Riggert, *Skylab's Fiery Finish*, 156 *NAT'L GEOGRAPHIC* 581, 581-84 (1979).

143. See generally M. BENKO, W. DEGRAFF & G. REIJNEN, *supra* note 141, at 49-51 (account of the *COSMOS 954* crash); Note, *supra* note 142, at 270-71 (describing the circumstances surrounding the accident, including the extent of the radioactive contamination and clean-up efforts). Some of the satellite debris registered lethal levels of radiation. *Id.* at 50.

144. See Straubel, *supra* note 13, at 190.

145. M. BENKO, W. DEGRAFF & G. REIJNEN, *supra* note 141, at 50.

124,000 square miles.¹⁴⁶

The United States assisted Canada in the cleanup, called Operation Morninglight, which finally cost Canada \$13.97 million.¹⁴⁷ However, Canada decided to claim only \$6.94 million from the Soviet Union as compensation for the cleanup.¹⁴⁸ After extensive negotiations, the Soviet Union responded by paying only \$3 million, arguing that Canada had taken excessive measures to restore the environment.¹⁴⁹

Canada presented its claim against the Soviet Union approximately one year after the accident.¹⁵⁰ The claim was based on the Liability Convention and "general principles of international law."¹⁵¹ The dispute arose because, according to some interpretations of the Liability Convention, Canada actually incurred no damages since the hazardous radioactive debris was scattered only over uninhabited wilderness.¹⁵²

The *COSMOS 954* incident illustrates one of the Liability Convention's main weaknesses: its definition of damages is too vague.¹⁵³ The conflict between the two countries finally was resolved, primarily through diplomatic circumvention of the Liability Convention.¹⁵⁴ Consequently, the incident "provides almost no guidance" with respect to future application of the Liability Convention.¹⁵⁵ The incident did, however, result in the establishment

146. Note, *supra* note 142, at 271.

147. See Straubel, *supra* note 13, at 189-90. All amounts are expressed in Canadian National Dollars.

148. *Id.* at 191.

149. *Id.*

150. Note, *supra* note 142, at 273.

151. *Id.* at 274. The Canadian government focused on the Liability Convention more than international law principles. *Id.* at 274 n.90.

152. See *id.* at 276. The Canadians claimed the environment was rendered "unfit for use." *Id.* However, others contended that "there was no such damage [as contemplated by the Liability Convention] since there was no loss of life, no personal injuries involved, or other impairment of health." *Id.* at 276 n.98.

153. See *id.* at 279-80. The drafters of the Liability Convention "realized that no consensus could be reached on the formulation of damage law to be applied for space activities." Bosco, *supra* note 105, at 333-34. Therefore, only general guidelines were established. *Id.* This compromise complicates the damage recovery issue. It is an "ambiguity [that] undercuts the basic purpose of the Liability Convention, which is to provide effective rules and procedures for the prompt payment of compensation to victims." Note, *supra* note 142, at 285.

154. See Note, *supra* note 142, at 280.

155. *Id.* "Due to the diplomatic nature of the resolution, there was no opportunity to see how the substantive provisions of the Liability Convention would work in the context of a satellite reentry and crash." *Id.* at 280 n.118 (quoting Address by L.H. Legault & A. Farand, Canada's Claim for Damage Caused by the Soviet COSMOS 954 Satellite, at 19-

of international "norms" to assist in diplomatic resolution of future disputes involving outer space:

The norms established by the Cosmos 954 incident provide that the major satellite launching nations — the U.S. and the U.S.S.R. — notify each other of hazardous events due to satellite failure, relay information to facilitate damage control, assist their political allies in cleanup operations, and share the cost of compensating the state injured by a falling satellite, regardless of whose satellite caused the injury and regardless of fault.¹⁵⁶

Whether these norms, in conjunction with the Liability Convention, would apply to current spacecraft accidents has yet to be determined.

III. A PROPOSAL FOR FEDERAL ACTION

The federal government should create legal guidelines that coordinate domestic and international laws governing private enterprise in outer space. To accomplish this, further steps must be taken to simplify application of space law. First, a comprehensive body of federal statutory and common law regarding commercial space activities must be developed. The federal laws should expressly preempt individual state tort actions and attempt to harmonize United States internal law with the internal law of other nations.¹⁵⁷ The European Economic Community is an example of such harmonization in the economic arena: "In practice, [harmonization] is concerned with mutual adjustment of national regulations to an agreed standard, with the approximation of member states' laws to the extent required for the proper functioning of the common market."¹⁵⁸ Second, the existing treaties governing international liability of signatories for their spacecraft launches must be refined to include specific claims of right and a ceiling for

23, ABA Forum Committee on Air and Space Law, First Annual Forum (Feb. 23-25, 1984)).

156. G. REYNOLDS & R. MERGES, *supra* note 15, at 174. Despite the lack of relevant provisions in the existing international agreements, the United States and the Soviet Union assumed the burden of notifying their respective allies of pending spacecraft accidents. *See id.* at 173. Therefore, the two leading nations in the area of space launches, over the objections of Canada in the COSMOS 954 case, have retained control over outer space activities. *See id.*

157. This note will not attempt a comparison of the tort law of all nations that may be affected by future spacecraft mishaps. It only expresses the desirability of consistency among nations.

158. Lodge, *Introduction: Internal Perspectives*, in *THE EUROPEAN COMMUNITY AND THE CHALLENGE OF THE FUTURE* 88 (J. Lodge ed. 1989).

damages.

A. Domestic Actions

A body of preemptive federal law governing commercial advancement in outer space would be beneficial to all parties involved. Private industry could better predict possible legal issues and liability without subjection to the uncertainty of the geographical location of a space-related accident and the respective choice-of-law rules.¹⁵⁹ Injured third parties would be treated equally in similar circumstances, thus preventing disparate litigation results based solely on the location of the accident. Similarly, the United States would benefit from the technological advances that typically follow a successful high technology endeavor.¹⁶⁰ Finally, domestic organizations would be assured access to outer space if they could rely on a domestic private space launch enterprise, even during times of international crisis when foreign launch agencies may not be available.

1. Federal Legislation

The federal government is capable of alleviating the pressures of potential liability on private space launch agencies by refining statutory regulation of the industry. To begin, Congress should create a statutory cause of action focusing on harm caused directly by the outer space activities of domestic organizations. The legislation would provide the exclusive means of recovery¹⁶¹ available to injured third parties suing in the state and federal courts of the United States. Where the injury suffered is death, the legislation would provide a hierarchy of survivors permitted to pursue claims against the launcher.¹⁶² The salient features of this pro-

159. See generally Bosco, *supra* note 20, at 16-20 (discussing various choice-of-law and conflict-of-laws rules and their effect on liability to third parties).

160. For instance, the space initiative launched by President John F. Kennedy resulted in computer and circuitry advances; improvements in communications and weather satellites, and navigational systems; and consumer goods, such as rechargeable cardiac pacemakers, freeze-dried foods, and Teflon. Sandomir, *Moon Dreams*, Newsday, July 9, 1989, Magazine, at 6.

161. The existing Launch Act already provides an express preemption of "any [state] law, rule, regulation, standard, or order which is inconsistent with the provisions of this chapter." 49 U.S.C. § 2620(a) (1988).

162. The Federal Employers' Liability Act ("FELA") provides a good example of a hierarchy of claimants: "[Defendant] shall be liable in damages to [the deceased employee's] personal representative, for the benefit of the surviving widow or husband and children of such employee; and, if none, then of such employee's parents; and, if none, then

posed legislation would be the imposition of absolute liability on launch agencies for damages sustained by third parties and a limit on recoverable damages. Consequently, litigation arising from a space accident would focus on the existence and extent of the plaintiff's damages, either through personal injury or property damage.¹⁶³

The theory behind imposition of absolute liability is identical to that used to support the absolute liability of aircraft owners and operators for damages caused by air crashes. The general rule concerning strict liability of aircraft accidents is:

If physical harm to land or to persons or chattels on the ground is caused by the ascent, descent, or flight of aircraft, or by the dropping or falling of an object from the aircraft, (a) the operator of the aircraft is subject to liability for the harm, even though he has exercised the utmost care to prevent it, and (b) the owner of the aircraft is subject to similar liability if he has authorized or permitted the operation.¹⁶⁴

If the word "aircraft" were replaced by the word "spacecraft" in the preceding provision, the result would be an excellent prototype for a federal statute creating a cause of action against owners and launchers of spacecraft.¹⁶⁵

A strict liability rule is desirable for two reasons. First, public policy favors imposing strict liability in situations of "one-sidedness in receipt of benefits and in creation of risks to others,"¹⁶⁶ and where "the person harmed would encounter a difficult problem of proof if some other standard of liability were applied."¹⁶⁷ Furthermore, the ability of the private space industry to distribute

of the next of kin dependent upon such employee " 45 U.S.C. § 51 (1988). For discussion of FELA as a legislative model, see *infra* text accompanying notes 174-82.

163. The issues of who may seek redress for what types of injury under the proposed legislation and upon what grounds such redress will be granted are policy questions for Congress to decide. For a further discussion of various options, see *infra* text accompanying notes 184-91.

164. RESTATEMENT (SECOND) OF TORTS § 520A (1977). *But see* Crosby v. Cox Aircraft Co., 109 Wash. 2d 581, 746 P.2d 1198 (1987) (liability of aircraft owners and operator for ground damage determined by negligence standard, not strict liability).

165. Internationally, states also have recognized absolute liability for aircraft damage to ground objects: "The Rome Convention of 1952 for damage on the surface of the Earth is based on absolute liability, [while] liability for collisions of aircraft [in flight] is based on fault." E. VAN BOGAERT, *supra* note 97, at 167.

166. Vold, *Strict Liability for Aircraft Crashes and Forced Landings on Ground Victims Outside of Established Landing Areas*, 5 HASTINGS L.J. 1, 3 (1954).

167. Peck, *Negligence and Liability Without Fault in Tort Law*, 46 WASH. L. REV. 225, 240 (1971).

the loss through insurance or otherwise justifies imposing strict liability.¹⁶⁸ Second, the reduction of the plaintiff's burden from not having to prove the defendant's culpability offsets the disadvantage of a federal cap on the amount of damages otherwise available to the plaintiff.¹⁶⁹

The creation of a preemptive federal cause of action based on strict liability is within the constitutional power of Congress. Courts have held that statutory strict liability is constitutionally permissible.¹⁷⁰ Moreover, "[i]t is well established that within constitutional limits Congress may pre-empt state authority by so stating in express terms."¹⁷¹ Federal control of the private space industry would fall within constitutional authorization. The commerce clause permits Congress to enact laws regulating activities that directly or indirectly affect the commerce and economic well-being of the entire country.¹⁷² Also, satellite launches traditionally have been an exclusive function of the federal government. Therefore, the government may legislate liability in order to continue regulatory control of the private space industry, as was done with nuclear power plants under the Atomic Energy Act of 1954.¹⁷³

Congressional regulation of private enterprise liability to third parties for damages caused by outer space activities would resemble other federally controlled liability schemes, including FELA¹⁷⁴ and the Jones Act.¹⁷⁵ FELA provides a negligence-based, federal cause of action for interstate railroad employees injured in the course of employment.¹⁷⁶ FELA preempts all state

168. See Vold, *supra* note 166, at 5 (strict liability is appropriate when an enterprise can distribute the cost of its losses to its customers).

169. For an explanation of the proposal to place a cap on damages, see *infra* text accompanying notes 184-91.

170. See, e.g., *United States v. Coastal States Crude Gathering Co.*, 643 F.2d 1125 (1981) (Congress has the power to impose a civil penalty on a strict liability basis).

171. *Pacific Gas & Elec. Co. v. State Energy Resources Comm'n*, 461 U.S. 190, 203 (1983) (discussing interpretation of the Atomic Energy Act of 1954, 42 U.S.C. § 2011 (1988)). In both the Atomic Energy Act and the Space Launch Act of 1984, the federal government surrendered its monopoly on research and development to private enterprise. The Atomic Energy Act allowed the federal government to maintain some control of nuclear technology, through licensing. *Id.* at 207; see 42 U.S.C. §§ 2073, 2111-2113.

172. See *NLRB v. Jones & Laughlin Steel Corp.*, 301 U.S. 1 (1937) (holding that the defendant must comply with requirements of the National Labor Relations Act of 1935 because its activities, although apparently local in nature, indirectly affect the national economy).

173. See 42 U.S.C. § 2210 (1988) (limiting liability for nuclear power licensees).

174. 45 U.S.C. §§ 51-60 (1988).

175. *Id.* § 688.

176. 19 C. WRIGHT, A. MILLER & E. COOPER, FEDERAL PRACTICE AND PROCEDURE

causes of action, eliminating various common law defenses such as contributory negligence and assumption of the risk.¹⁷⁷ The Jones Act gives merchant seamen essentially the same benefits and limitations as FELA provides for interstate railway employees.¹⁷⁸

Congress passed FELA because it was not satisfied with the manner in which the individual states handled negligence suits brought by railroad workers.¹⁷⁹ Congress therefore created a uniform national rule allowing injured railroad workers to recover damages, even if contributorily negligent, regardless of the otherwise applicable state tort law. If an employee dies as a result of the railroad's negligence, the surviving spouse and children are entitled to compensation under FELA.¹⁸⁰ Consequently, interstate railroad employers are faced with a "far more drastic duty of paying damages for injury or death at work due in whole or in part to the employer's negligence."¹⁸¹

The obvious benefit of this federal regulation is that railroad employees are more likely to recover damages. Less obvious, however, is the benefit received by the employers subject to FELA. Specifically, they are "protected, in a sense, from the nuances of law of the several states."¹⁸² The private space industry would benefit similarly from federal preemption of the various state causes of action.

As discussed above, federal regulation of the private space industry should include a cap on damages. The result would be greater uniformity and predictability of liability to third parties.

§ 4505, at 56 n.38 (1982).

177. "[T]he fact that the employee may have been guilty of contributory negligence shall not bar a recovery, but the damages shall be diminished by the jury in proportion to the amount of negligence attributable to such employee." 45 U.S.C. § 53.

178. "[W]ith the passage of the Jones Act Congress effectively obliterated all distinctions between the kinds of negligence for which the shipowner is liable, as well as limitations imposed by the fellow-servant doctrine, by extending to seamen the remedies made available to railroad workers under [FELA]." *Mitchell v. Trawler Racer, Inc.*, 362 U.S. 539, 546-47 (1960). Only FELA will be discussed in this note; however, because of the similarity between the two acts, the Jones Act provisions are equally relevant.

179. See *Rogers v. Missouri Pac. R.R. Co.*, 352 U.S. 500, 507, *reh'g denied*, 335 U.S. 943 (1957) (noting congressional dissatisfaction with treatment of railroad negligence suits under the common law master-servant doctrine).

180. See 45 U.S.C. § 51 (1988). FELA further provides a hierarchy of claimants. See *supra* note 162 and accompanying text.

181. *Rogers*, 352 U.S. at 507; *accord Heater v. Chesapeake & Ohio Ry. Co.*, 497 F.2d 1243, 1246 (7th Cir.) (quantum of negligence required under FELA is less than ordinary negligence), *cert. denied*, 419 U.S. 1013 (1974).

182. *Toscano v. Burlington N.R.R. Co.*, 678 F. Supp. 1477, 1479 (D. Mont. 1987).

One commentator summarized the vast differences in state law as follows:

There are patently indefensible differences among the laws of the states regarding damages in wrongful death cases. Under Florida law, for example, which permits damages for mental pain and suffering of next of kin, an award of \$1.8 million in damages was affirmed for the death of a 16 year-old boy, as a result of the crash of a commercial airliner. Indiana law, on the other hand, limits the damages in such a case to funeral expenses and nominal costs for administering the estate.¹⁸³

A federally imposed damage limitation for spacecraft launches already has been considered by the United States. President Reagan's national space policy supported imposition of a \$200,000 cap on the noneconomic damages that an individual may recover, but Congress chose the "maximum liability insurance reasonably available" requirement as provided in the Launch Amendments.¹⁸⁴ Noneconomic damages include punitive damages, which constitute the primary motivation for congressional desire to limit liability,¹⁸⁵ and damages for pain, suffering, and other mental or emotional harms for which measurement is difficult.¹⁸⁶ Noneconomic damages, according to critics, should be eliminated generally because "they are unusually susceptible to overstatement and abuse."¹⁸⁷ Furthermore, in the event of a catastrophic space-related accident, the limited amount of insurance provided by the Launch Amendments would be used primarily to replace the economic losses of a greater number of claimants.

The cap on damages proposed by this note can be incorporated into the federal scheme in one of three ways. First, the previously discussed \$200,000 limit on noneconomic damages can be reinstated, relying solely on state law to provide the specific causes of action available to plaintiffs claiming such harm. The weakness

183. Kennelly, *Aviation, the Need for Uniform Legislation*, 48 J. AIR L. & COM. 613-15 (1983).

184. See *Liability Hearings*, *supra* note 27, at 18 (statement of OCST Director Courtney A. Stadd); Comment, *supra* note 1, at 141 (discussing liability cap options).

185. See *Liability Hearings*, *supra* note 27, at 17 (noting that the congressional intent was to limit punitive damages, which "tend to be the most difficult for corporations to respond to").

186. See Hicks, *Statutory Damage Caps are an Incomplete Reform: A Proposal for Attorney Fee Shifting in Tort Actions*, 49 LA. L. REV. 763, 764 (1989) ("[N]oneconomic damages are haphazardly awarded, are marginally related to their ostensible purpose, and are routinely used as an indirect and covert means of paying plaintiff's legal fees.").

187. *Id.* at 769.

in this option is that it would result in varying damage awards to parties injured in different states.¹⁸⁸ For example, states differ on the treatment of emotional distress damages in absolute liability actions.¹⁸⁹ One state may allow liberal recovery of emotional distress damages, requiring only that the injured party be related to the victim and know of the accident shortly after its occurrence.¹⁹⁰ Another state, however, might deny recovery of emotional harm unless the close relative who witnesses the accident is also within the zone of physical danger at the time of its occurrence.¹⁹¹ As a result, a spacecraft launcher could be absolutely liable for up to \$200,000 for emotional distress caused in one state but would have no liability for the same type of injury in another state. The defendant's total liability and the sufficiency of its insurance would depend entirely on the chance location of the spacecraft accident.

The second possibility is to create a federal provision that specifies the theories of noneconomic damage recovery available to injured third parties. For instance, Congress could adopt a single approach to emotional distress recovery or even eliminate such recovery altogether. Injured third parties would receive equal or similar noneconomic damage awards regardless of accident location. Also, the amount and type of noneconomic damage liability within the \$200,000 limit would be more predictable for the private space industry.

The third possibility is to allow injured third parties to pursue any claim recognized by the applicable state law but cap all damages, economic and noneconomic. This approach would enhance predictability for spacecraft launchers by establishing the full extent of their potential liability for each third party claim. Also, the limited pool of insurance funds would cover a larger number of

188. For a discussion of the benefits of national uniformity in space tort law, see Note, *supra* note 89, at 512.

189. See generally Comment, *Bystander Recovery: A Policy Oriented Approach*, 32 N.Y.L. SCH. L. REV. 877 (1987) (discussing emotional injury law and particularly the various standards applied in bystander-recovery cases).

190. See, e.g., *Pearsall v. Emhart Indus., Inc.*, 599 F Supp. 207 (E.D. Pa. 1984), (allowing recovery of damages for emotional harm in a strict liability action against a smoke alarm manufacturer, even though the plaintiff was not in any physical danger and did not actually witness the fire that killed her husband and children).

191. See, e.g., *Smith v. Hub Mfg., Inc.*, 634 F Supp. 1505 (N.D.N.Y. 1986) (denying parents of a drowned boy recovery of damages for emotional distress in a strict products liability action against pool ladder manufacturer because parents were not personally in danger of physical harm).

victims before requiring government indemnification of the remaining awards. However, limiting all damages would be unfair to parties that sustain substantial economic loss. Such claimants would receive inadequate compensation for concrete economic claims while other victims could receive equal compensation based exclusively on more intangible, noneconomic damages.

Weighing the above considerations, policy makers should choose the second approach, which provides specific and exclusive federal action for recovery of noneconomic damages. Any settlement or litigation could then focus entirely on the legislation, free of the inconsistencies of state tort law. Furthermore, a cap on noneconomic damages would enhance predictability of potential liability and ensuing insurance coverage.

2. Federal Common Law

Despite the popular view that the Supreme Court's holding in *Erie Railroad Co. v. Tompkins*¹⁹² eliminated federal common law, federal common law still exists, although it is rarely imposed.¹⁹³ Federal common law has been reserved for disputes involving "substantially federal interests,"¹⁹⁴ including "(1) cases in which a state is a party, (2) admiralty and maritime cases, (3) cases concerning 'proprietary' interests of the United States and (4) proceedings involving international relations."¹⁹⁵ Space law has many features in common with admiralty and maritime law,¹⁹⁶ and involves international relations. In addition, as stated by the court in *Sola Electric Co. v. Jefferson Electric Co.*,¹⁹⁷ federal common law is applicable "to those areas of judicial decision within which the policy of the law is so dominated by the sweep of federal statutes that legal relations which they affect must be deemed governed by federal law having its source in those statutes, rather than by local law."¹⁹⁸ Given the extensive federal regulation of space exploration, outer space tort law requires the de-

192. 304 U.S. 64 (1938).

193. See Note, *supra* note 89, at 513. "[*Erie*] has come to be seen as having provided the base for a new federal common law and not as having, in any meaningful sense, established the supremacy of state law." G. GILMORE & C. BLACK, *THE LAW OF ADMIRALTY* 459 (2d ed. 1975).

194. *Id.* at 514.

195. *Id.*

196. See *infra* notes 203-08 (comparing space law and maritime law).

197. 317 U.S. 173 (1942).

198. *Id.* at 176.

velopment of applicable federal common law standards.

Establishment of federal common law is especially important in the international realm. In *Banco Nacional de Cuba v. Sabbatino*,¹⁹⁹ the Supreme Court of the United States recognized the need for federal common law in cases involving foreign countries. The Court ruled that "relationships with other members of the international community must be treated exclusively as an aspect of federal law"²⁰⁰ because the "rules of international law should not be left to divergent and perhaps parochial state interpretations."²⁰¹ As a practical matter, "[t]he need for uniformity in the law affecting foreign nations is clear, and application of state law would preclude the attainment of this uniformity."²⁰² Establishment of federal common law therefore would enhance efficient execution and predictability of the United States' treaties and relevant legislation.

Maritime law, like international law, is another example of a large body of federal common law. In fact, maritime law has been suggested as a model for development of federal common law for outer space.²⁰³ Furthermore, the complete realm of maritime law, like that of space law, includes international and domestic issues involving all vessels registered with the United States.²⁰⁴ Admiralty deals with inland waters of the United States²⁰⁵ and the high seas, while space law deals with the national air space immedi-

199. 376 U.S. 398 (1964).

200. *Id.* at 425.

201. *Id.* (citing Jessup, *The Doctrine of Erie Railroad v. Tompkins Applied to International Law*, 33 AM. J. INT'L L. 740 (1939) (authored by then-Judge Philip C. Jessup of the International Court of Justice)).

202. Note, *supra* note 89, at 522 (quoting M. REDISH, *FEDERAL JURISDICTION: TENSIONS IN THE ALLOCATION OF JUDICIAL POWER* 94 (1980)).

203. See, e.g., *id.* at 524-28 (using maritime law as a "legal model" for outer space law); M. McDUGAL, H. LASSWELL & I. VLASIC, *supra* note 85, at 105 ("The fact that a structure of unorganized inclusive competence has worked so well for several centuries in regulating the shared enjoyment of the oceans is propitious.").

204. The requirement to register a vessel is provided by the Convention on the High Seas, Apr. 29, 1958, art. 6(1), 13 U.S.T. 2312, 2315, T.I.A.S. No. 5200, at 4, 450 U.N.T.S. 82, 86. This requirement is similar to that of the Convention on Registration of Objects Launched into Outer Space, *supra* note 89. "Ordinarily a state confers its nationality on a ship by registering the ship, authorizing it to fly its flag, and issuing documents evidencing the ship's nationality." L. SOHN & K. GUSTAFSON, *THE LAW OF THE SEA IN A NUTSHELL* 3 (1984).

205. The United States' "jurisdiction includes ports, harbors, bays and other enclosed arms of the sea along its coast and a marginal belt of the sea extending from the coastline outward three nautical miles." 1 M. NORRIS, *THE LAW OF SEAMEN* 10 (3d ed. 1970).

ately above the United States²⁰⁶ and outer space. Of particular importance is the fact that outer space, which lies beyond the airspace claimed by any nation, is a *res communis*,²⁰⁷ and therefore not under the jurisdiction of any nation. Consequently, there should be a "nationally uniform system" of space law, much as there is such a system of maritime law²⁰⁸

B. International Measures

The existing treaties governing liability of spacefaring nations for damage caused by their citizens to foreign third parties establish a solid legal foundation and encourage global cooperation in outer space. However, further international agreements, specifying more precisely the causes of action and damages available to parties injured by foreign outer space activities, are needed. The prospects for a new or modified liability convention are apt to improve as more nations advance technologically into the space age.²⁰⁹

The international agreement proposed in this note would provide a rule of absolute liability for injury or damage to third parties caused by the outer space activities of its signatories. As under the Liability Convention, each state would be liable for its own outer space activities as well as private space launches from

206. "The United States of America is declared to possess and exercise complete and exclusive national sovereignty in the airspace of the United States, including the airspace above all inland waters" 49 U.S.C. § 1508(a) (1988); see Centre for Research of Air and Space Law, *Space Activities and Emerging International Law* 356-86 (1984) (unpublished manuscript available from McGill University) (discussing in detail the possible approaches to delimitation of airspace and outer space). Among the approaches suggested are the "minimum altitude at which a satellite can orbit, [which is] approximately 80 kilometers," *id.* at 378, and the maximum altitude at which "the atmosphere supports craft passing through it," which is 50 to 80 kilometers, *id.* at 377.

207. Note, *supra* note 89, at 517 n.61 (defining *res communis* as those areas that are beyond the jurisdiction of any nation).

208. *Id.* at 524-26 (proposing that the nationally uniform system of maritime law be used as a model for a system of space law); see *Southern Pac. Co. v. Jensen*, 244 U.S. 205, 215 (1917) (praising the advantages of the maritime system).

209. Nations developing space programs tend to become more interested in limiting their own liability and less concerned about protecting their citizens from countries with better established space programs. There are several countries currently developing space programs. Israel recently became the latest country to orbit its own satellite. Gauthier, *A Blueprint for the '90s*, AD ASTRA, May 1989, at 24, 24. In addition, Saudi Arabia has purchased missiles and boosters from the People's Republic of China in order to place satellites in orbit, and India is developing a new launch vehicle. *Id.*, see *UN Space Committee Notes 1988 Achievements by Nations*, UN CHRON., June 1989, at 36 (listing international strides in outer space development).

its territory or facilities.²¹⁰ Although the signatories would still be ultimately responsible for all launches from their facilities, the proposal would have the effect of holding the actual launching entity, whether public or private, primarily responsible for compensation of third parties, since most countries would probably adopt insurance requirements for private launches similar to those imposed in the United States. In other words, the treaty would create an exclusive cause of action under which an injured third party could seek damages directly from the organization that conducted the outer space activity. The nation from which the launch was conducted, however, would be responsible for providing compensation in excess of the amount the launch agency is able to pay. To assist the launching agencies, the proposed liability treaty, like the proposed domestic legislation, would place a \$200,000 limit on noneconomic damages and provide specific and exclusive bases for the recovery of noneconomic damages.

An excellent working model for a modern liability treaty is the Warsaw Convention of 1929.²¹¹ The Warsaw Convention "establish[ed] a uniform body of world-wide liability rules to govern international aviation, which supersede[d] with respect to international flights the scores of differing domestic laws, leaving the latter applicable only to the internal flights of each of the countries involved."²¹² Specifically, the convention holds negligent international air carriers liable for damages sustained by a party for the "death or wounding of a passenger"²¹³ and the "destruction or loss of any registered luggage or goods"²¹⁴ occurring in the course of an international flight.²¹⁵ However, a carrier's lia-

210. The definition of a "launching state" would be identical to that provided by the Liability Convention. See Liability Convention, *supra* note 88, art. I(c), 24 U.S.T. at 2392, T.I.A.S. No. 7762, at 4, 961 U.N.T.S. at 189.

211. Convention for the Unification of Certain Rules Relating to International Carriage by Air, Oct. 12, 1929, 49 Stat. 3014, T.S. No. 876, at 16, 137 L.N.T.S. 11 [hereinafter Warsaw Convention]. The United States' accession to the Warsaw Convention became effective October 29, 1934. *Id.* at 3013, T.S. No. 876, at 15, 156 L.N.T.S. 258.

212. *Reed v. Wiser*, 555 F.2d 1079, 1090 (2d Cir.), *cert. denied*, 434 U.S. 922 (1977) (footnote omitted); *accord Domangue v. Eastern Air Lines*, 722 F.2d 256, 262 (5th Cir. 1984) (The Warsaw Convention was "intended to act as a uniform international law which supplants each member nation's varied laws." (citing *Block v. Compagnie Nationale Air France*, 386 F.2d 323, 337-38 (5th Cir. 1967), *cert. denied*, 392 U.S. 905 (1968))).

213. Warsaw Convention, *supra* note 211, art. 17, 49 Stat. at 3018, T.S. No. 876, at 26, 137 L.N.T.S. at 23.

214. *Id.*, art. 18, at 3019, T.S. No. 876, at 21, 137 L.N.T.S. at 23.

215. The Warsaw Convention defines "international carriage" as "any carriage in which the place of departure and the place of destination are situated within

bility is limited under the Warsaw Convention to \$10,000 for injury to passengers and \$9.07 per pound for damage to baggage.²¹⁶

In 1966, the Warsaw Convention was modified by the Montreal Agreement²¹⁷ in order to prevent the United States from renouncing the convention.²¹⁸ Under the Montreal Agreement, the air carrier is strictly liable and is subject to a larger damage cap of \$75,000.²¹⁹ Any international air carrier stopping in the United States at any point from departure to destination is subject to the terms of the Montreal Agreement.²²⁰

The Warsaw Convention, as amended by the Montreal Agreement, is not an entirely appropriate model for the proposed outer space liability treaty. For instance, the Warsaw Convention fails to require governmental indemnity for damages exceeding an air carrier's financial resources. However, the rationale for imposing strict liability is essentially identical: to compensate third parties for the relatively low cap on damages by reducing litigation time and expense.²²¹ Conversely, the damage limitation benefits the tortfeasor in compensation for being held strictly liable.

Implementation of the proposed outer space liability treaty can be accomplished in two ways. First, the process could simply parallel that developed by the Warsaw Convention. In the United States, for example, the treaty would create a cause of action against the launching organization and preempt conflicting local

the territories of two High Contracting Parties " *Id.*, art. 1, at 3014, T.S. No. 876, at 16, 137 L.N.T.S. at 15.

216. L. GOLDBIRSCH, *THE WARSAW CONVENTION ANNOTATED: A LEGAL HANDBOOK* 93 (1988).

217. Liability Limitations of the Warsaw Convention and the Hague Protocol, 31 Fed. Reg. 7,302 (1966). "The Montreal Agreement, not a treaty itself but an agreement among the carriers, did not change the text of the Warsaw Convention. Rather, it modified the terms of the Convention with respect to international transportation involving a location in the United States." *Maugnie v. Compagnie Nationale Air France*, 549 F.2d 1256, 1259 n.6 (9th Cir.), *cert. denied*, 431 U.S. 974 (1977). See generally Lowenfeld & Mendelsohn, *The United States and the Warsaw Convention*, 80 HARV. L. REV. 497, 563-75 (1967) (describing the dissension at the Montreal Convention).

218. L. GOLDBIRSCH, *supra* note 216, at 7. The United States decided that the Warsaw Convention established unacceptably low limits on carrier liability. A meeting was therefore held in Montreal to modify the convention in a manner acceptable to the United States. *Id.*

219. *Id.*

220. The international agreement proposed in this note would apply to all space launches because of the inherently international scope of a spacecraft launch.

221. See Lowenfeld & Mendelsohn, *supra* note 217, at 600 (discussing justifications for strict liability under the Warsaw Convention).

law²²² Actual interpretation of the treaty would essentially be developed through federal common law. "[T]he determination of the scope of the Warsaw Convention is a matter of federal law and federal treaty interpretation. Conflicts principles are not applicable in interpreting the words of the Convention; rather, the meaning should be ascertained from the intention of the drafters and the goals of the Convention."²²³

A problem could arise, however, through reliance on national court interpretations of the proposed outer space liability treaty. Specifically, if capped noneconomic damages are considered inadequate, the respective national courts may develop means of treaty circumvention, such as strict treaty interpretation, which would reduce overall treaty effectiveness.

This problem has been encountered by air carriers attempting to enforce the provisions of the Warsaw Convention in United States courts. Two provisions in the Warsaw Convention "strip the limitation of liability from an air carrier."²²⁴ First, an air carrier is subject to unlimited liability if the carrier's "willful misconduct" causes the damage, injury, or death.²²⁵ Second, unlimited liability may exist if a passenger's ticket or claim check has not been delivered or does not adequately explain the liability limiting provisions of the Convention.²²⁶ United States courts have exploited this second provision through "judicial maneuverings and innovative interpretations"²²⁷ to provide the basis for circumventing the Warsaw Convention's liability limitations.²²⁸ The

222. "[A] treaty pre-empts, or takes precedence over any conflicting state or local law." L. GOLDBIRSH, *supra* note 216, at 4 (citing *Boehringer-Mannheim Diagnostics, Inc. v. Pan Am*, 737 F.2d 456 (5th Cir. 1984) (Texas law permitting recovery of attorney's fees against carriers for damaged cargo preempted by Warsaw Convention), *cert. denied*, 469 U.S. 1186 (1985); *Baker v. Landsell Protective Agency, Inc.*, 590 F. Supp. 165 (S.D.N.Y. 1984) (recovery against airport security employees for jewelry theft limited to maximum liability set by Warsaw Convention)).

223. *Maugnie v. Compagnie Nationale Air France*, 549 F.2d 1256, 1258 n.2 (citing *Hussert v. Swiss Air Transport Co.*, 388 F. Supp. 1238 (S.D.N.Y. 1975)).

224. *In re Korean Air Lines Disaster* of Sept. 1, 1983, 664 F. Supp. 1463, 1471 (D.D.C. 1985).

225. Warsaw Convention, *supra* note 211, art. 25, 49 Stat. at 3020, T.S. No. 876, at 23, 137 L.N.T.S. at 27.

226. *See id.* arts. 3-4, at 3015-16, T.S. No. 876, at 17-18, 137 L.N.T.S. at 15, 17.

227. *Korean Air Lines Disaster*, 664 F. Supp. at 1472.

228. *See, e.g., Mertens v. Flying Tiger Line*, 341 F.2d 851 (2d Cir.) (delivery of a ticket to a passenger already on the plane does not meet Convention requirement that notice of liability limits be given to passengers), *cert. denied*, 382 U.S. 816 (1965); *Lisi v. Alitalia-Linee Aeree Italiane*, 253 F. Supp. 237, 239 (S.D.N.Y. 1966) ("[C]ompliance with the Convention requires not mere physical delivery of a ticket and check before depar-

broad range of possible interpretations by a variety of national courts impedes progress toward the Convention's goal of a uniform international interpretation.²²⁹ To prevent similar frustration of future outer space liability treaties, national courts should be directed to consider the "history and intent of the contracting sovereigns"²³⁰ and reject the temptation to assist plaintiffs by creating loopholes that negate treaty effectiveness.

The second option for implementation of the proposed outer space treaty would require the creation of an independent international tribunal dealing exclusively with space-related accidents. In practice, the outer space tribunal could be patterned after other specialized international courts such as the European Court of Human Rights, which was created "to ensure the observance" of the European Convention on Human Rights.²³¹ Like the European Court of Human Rights, the international outer space tribunal would hear cases brought by a sovereign state as well as "an individual, a group of individuals, or a nongovernmental organisation."²³² The tribunal would resolve disputes in accordance with proposed outer space treaty provisions, "international custom,"²³³ and "general principles of the law of civilized nations."²³⁴

ture but delivery of a ticket and check which notify the passenger that the provisions of the Convention which exclude or limit liability are applicable."), *aff'd*, 370 F.2d. 508 (2d Cir.), *aff'd*, 390 U.S. 455 (1968). The Supreme Court has since rejected this maneuver. *Chan v. Korean Air Lines*, 490 U.S. 1922 (1989).

229. *Compare Korean Air Lines Disasters* 664 F Supp. at 1476 (notification printed in eight point type on passenger ticket is sufficient despite Montreal Agreement provision that ten-point type be used) *with Lisi*, 253 F Supp. at 243 ("Lilliputian typography" provides insufficient notice to passenger of carrier's limited liability).

230. *Korean Air Lines Disaster*, 664 F Supp. at 1471 (citing *Choctaw Nation v. United States*, 318 U.S. 423 (1943)).

231. J. MERRILLS, *THE DEVELOPMENT OF INTERNATIONAL LAW BY THE EUROPEAN COURT OF HUMAN RIGHTS* 1 (1988); see A. ROBERTSON, *HUMAN RIGHTS IN EUROPE* 193-236 (2d ed. 1977) (summarizing the history and operation of this court).

232. J. MERRILLS, *supra* note 231, at 2. This would contravene classic principles of international law, which allow only sovereign states to appear as parties before international tribunals. Statute of the International Court of Justice, *supra* note 137, art. 34, 59 Stat. at 1059, T.S. No. 993, at 29. The classical rule reflects "the belief that the equality and dignity of sovereign states would be compromised if states were sued by private parties" H. STEINER & D. VAGTS, *supra* note 84, at 244.

233. Statute of the International Court of Justice, *supra* note 137, art. 38(b), 59 Stat. at 1060, T.S. No. 993, at 30.

234. *Id.* art. 38(c), at 1060, T.S. No. 993, at 30. The European Court of Human Rights decides cases according to several international agreements. See J. MERRILLS, *supra* note 231, at 198. Therefore, as would be the case with the outer space tribunal, "[t]he majority of references to general international law [will concern] points of jurisdiction or procedure." *Id.* at 184.

Formation of an outer space tribunal would eliminate the risk of biased treaty interpretation by national courts and thus protect launchers from inequitable rulings that circumvent the treaty damage limitation provisions. This would increase the predictability of damage awards, enabling launchers to plan and structure their enterprises more efficiently. However, creation of this tribunal might discourage injured third parties from pursuing valid claims. The geographical location of the court alone might present an insurmountable obstacle to many potential litigants because of the travel expenses involved. This would be particularly true for indigent victims, who are most in need of compensation. Furthermore, because the tribunal would adopt its own procedural rules, litigating before it would be more complicated than simply pursuing a claim before one's own national court. The added complexity would increase the cost of bringing a claim. Therefore, it may be best to proceed without the creation of the international tribunal.

In summary, the following statement concerning the Warsaw Convention, made in 1934 by Secretary of State Cordell Hull, aptly summarizes the advantages of an international agreement specifying and limiting third party damages:

[T]he principle of limitation of liability will not only be beneficial to passengers and shippers as affording a more definite basis of recovery and as tending to lessen litigation, but it will prove to be an aid in the development of international air transportation, as such limitation will afford the carrier a more definite and equitable basis on which to obtain insurance rates, with the probable result that there would eventually be a reduction of operating expenses for the carrier and advantages to travelers and shippers in the way of reduced transportation charges.²³⁵

These same advantages would result from an outer space liability treaty creating causes of action and damage limitations available to injured third parties, regardless of the method of adjudication.

CONCLUSION

The federal government has assigned the responsibility of developing outer space through commercial space launches to private enterprise. As a result, domestic corporations must now com-

235. SENATE COMM. ON FOREIGN RELATIONS, MESSAGE FROM THE PRESIDENT OF THE UNITED STATES TRANSMITTING A CONVENTION FOR THE UNIFICATION OF CERTAIN RULES RELATING TO INTERNATIONAL TRANSPORTATION BY AIR, S. EXEC. DOC. NO. G, 73d Cong., 2d Sess. 3-4 (1934).

pete with launch agencies subsidized by foreign governments, including Arianespace, which is the current international leader in commercial space launches. The Commercial Space Launch Act Amendments of 1988 greatly assist private industry in this endeavor. However, even this legislation acting in tandem with existing international treaties leaves the outcome of litigation, especially concerning third party damages, troublingly uncertain.

Further steps should be taken by the federal government to assist private industry. For instance, federal statutory and common law regarding outer space should be developed to increase the uniformity and predictability of litigation. The resulting legal regime should include a strict liability standard for damage and injury to third parties. Also, there should be a cap on damages in order to further advance uniformity and predictability. Finally, the United States should seek a modified liability treaty among spacefaring nations establishing on an international scale the same basic provisions adopted domestically. The combined domestic and international efforts of the federal government would further reduce uncertainty and reserve the limited amount of insurance available on the world market for compensation of economic loss.

It is important to realize that "[n]ot one dollar of losses has [ever] been paid on a third party claim, despite hundreds of launches" by the United States.²³⁶ The proposals set forth in this note, which favor the spacecraft launchers, will therefore probably never have to be used in actual litigation. They will, however, secure the availability of affordable insurance coverage for a fledgling industry facing well-established, heavily subsidized foreign competitors. The special treatment proposed focuses solely on getting private outer space enterprise off the ground.

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236. *Liability Hearings*, *supra* note 27, at 1 (statement of Senator Riegle).

